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4401 Great America Parkway  
Santa Clara, CA 95054

# **Installation and Reference for the BayStack 22 PC Card Adapter**

**NO** **RTEL**  
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Congratulations on your purchase of a BayStack™ 22 PC Card Adapter, which supports 10 Mb/s and/or 100 Mb/s transmission speeds. This network card is intended for use in laptop computers. You can use a similar product, the BayStack 21 PCI 10/100 Adapter w/WOL, in a desktop workstation or server.

## Before You Begin

This guide provides information about using the features and capabilities of the BayStack 22 PC Card Adapter.

This guide is intended for Ethernet local area network (LAN) administrators with the following background:

- Working knowledge of PC terminology and operation
- Working knowledge of 10BASE-T (Ethernet) and 100BASE-TX (Fast Ethernet) operations
- Nortel Networks™ network experience

## Text Conventions

This guide uses the following text conventions:

<b>bold text</b>	Indicates command names and options and text that you need to enter. Example: Enter <b>a:\</b> .
separator ( > )	Shows menu paths. Example: From the Windows taskbar, choose Start > Settings > Control Panel.

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Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5402-7041



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# Chapter 1

## Introduction

This chapter provides an overview of the BayStack 22 PC Card Adapter, including its hardware and software components. The BayStack 22 PC Card Adapter complements the BayStack 70-Series 10/100 Ethernet Switches and BayStack 60-Series 10/100 Ethernet Hubs.



**Note:** The BayStack 22 PC Card Adapter, also known as the BayStack 22 PC Card Adapter in this document, may also be referred to as a PCMCIA Ethernet Adapter.

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## BayStack 22 PC Card Adapter Overview

The BayStack 22 PC Card Adapter provides network connectivity to laptop computers. You install the network card into your computer to access network resources such as servers, printers, and the Internet or intranet. You can install the BayStack 22 PC Card Adapter on many operating systems, such as Microsoft® Windows® 95, Windows 98, and Windows NT® or Novell NetWare.

## Product Features

The BayStack 22 PC Card Adapter provides the following features:

- Plug-and-play installation for Windows 95 and Windows 98
- 10/100 Mb/s autonegotiation with half- and full-duplex support
- 20/200 Mb/s full-duplex support

## Product Description

The BayStack 22 PC Card Adapter is a standard-size PCMCIA card. A media coupler provides network access to your laptop computer.

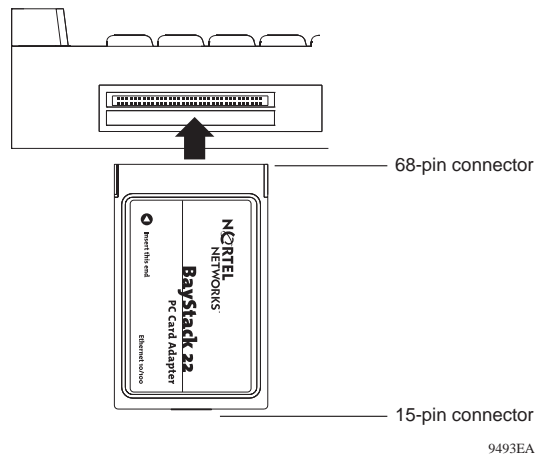
### BayStack 22 Network Card

The BayStack 22 PC Card Adapter includes the following components:

- 68-pin connector
- 15-pin connector
- Media coupler, including:
  - 10 megabits per second (Mb/s) and 100 Mb/s Link LEDs
  - Activity LED
  - 15-slot connector
  - RJ-45 port

#### 68-Pin Connector

The standard 68-pin connector on one end of the BayStack 22 PC Card Adapter ([Figure 1-1](#)) plugs into the Type II or Type III slot on your computer.



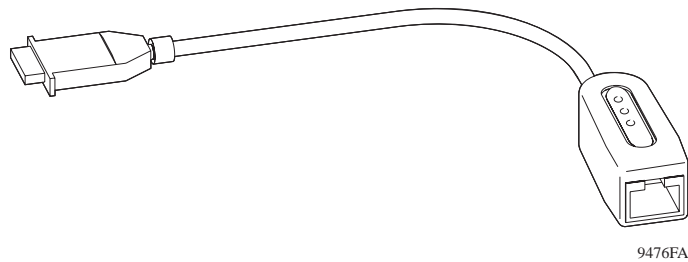
**Figure 1-1. BayStack 22 Network Card Connectors**

## 15-Pin Connector

The standard 15-pin connector on the other end of the BayStack 22 PC Card Adopter ([Figure 1-1](#)) attaches to the 15-slot connector on the media coupler.

## Media Coupler

The media coupler ([Figure 1-2](#)) provides connection to the BayStack 22 PC Card Adopter and to Ethernet network devices. Three LEDs located on the media coupler indicate 10 Mb/s or 100 Mb/s transmission speed and connection stability.



**Figure 1-2. Media Coupler**

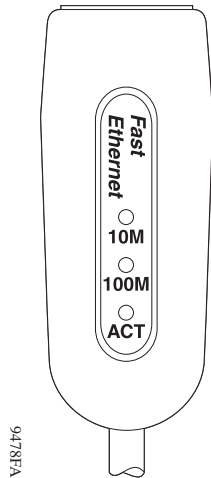
The 15-slot connector on the media coupler attaches to the 15-pin connector on the BayStack 22 PC Card Adopter. The other end of the media coupler contains an RJ-45 port. You can attach a standard Ethernet cable to the RJ-45 port to connect the network card to a network device such as a hub or switch.

## ***RJ-45 Ethernet Port***

The RJ-45 10BASE-T/100BASE-TX Ethernet port adapts to the correct network speed of 10 Mb/s or 100 Mb/s through autonegotiation with the board components of the network card. The port is wired as an MDI-X port to connect to other devices without using a crossover cable.

## **LEDs**

The media coupler contains three LEDs ([Figure 1-3](#)).



**Figure 1-3. LEDs**

The 10 Mb/s and 100 Mb/s Link LEDs indicate successful network connections to Ethernet and Fast Ethernet devices, respectively. The Link LEDs remain steady if the connection is stable. You should check the RJ-45 connection if the LED is not steady. The Activity LED indicates that network traffic is passing through the port.

[Table 1-1](#) describes the Link and Activity LED indications.

**Table 1-1. LED Indications**

Label	Color	Activity	Description
10M	Green	On	A 10 Mb/s connection has been established.
		Off	Power is not supplied to the network card, or a 10 Mb/s connection is not established.
100M	Green	On	A 100 Mb/s connection has been established.
		Off	Power is not supplied to a network card, or a 100 Mb/s connection is not established.
ACT	Green	On	Heavy network traffic is passing through the port.
	Green	Blinking	Network traffic is passing through the connected port. The rate of blinking is proportional to the amount of network traffic.

## System Requirements

Laptop computers using the BayStack 22 PC Card Adopter must meet the following requirements:

- A laptop computer that is IBM compatible and includes:
  - A 386SX or faster processor
  - At least one Type II PC Card socket
  - Card Services and Socket Services compliant with PCMCIA Release 2.1
- Microsoft Windows 95, Windows 98, or Windows NT, including an operating system as described in [“Operating Environments.”](#)
- 100BASE-TX Fast Ethernet or 10BASE-T Ethernet connectivity to your local area network (LAN)

## Operating Environments

The BayStack 22 PC Card Adopter supports the following operating systems:

- Microsoft Windows NT 3.51, 4.0
- Microsoft Windows 95, Windows 98
- Microsoft LAN Manager 2.x
- Microsoft Windows for Workgroups 3.11
- Microsoft Windows 3.1
- Novell NetWare 3.x, 4.x
- Lantastic 6.0
- IBM OS/2 Warp Version 3

## Cable Requirements

You can use Category 5 (Cat 5) Ethernet cables for 10 Mb/s and 100 Mb/s network connections to the BayStack 22 PC Card Adopter.

Use the following guidelines when using Cat 5 cables:

- Maximum length between a workstation and a hub is 100 meters (m).
- Maximum length between two hubs is 10 m.
- Maximum length between two hubs that are functioning as Ethernet Class 2 repeaters is 100 m.
- Maximum total length between two workstations is 205 m.

### Fast Ethernet Cables (100 Mb/s)

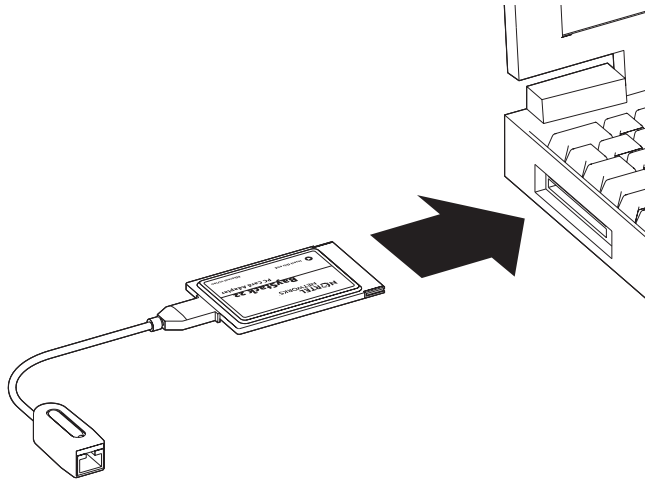
You must use a Cat 5 straight-through cable with one RJ-45 connector on each end for 100 Mb/s Ethernet connections. Do not use a crossover cable.

### Ethernet Cables (10 Mb/s)

You can use Cat 3, Cat 4, or Cat 5 unshielded twisted pair (UTP) cable or an EIA/TIA-568 100-ohm shielded twisted pair (STP) cable for 10 Mb/s Ethernet connections. You must use a straight-through cable with an RJ-45 connector on each end. Do not use a crossover cable.

## Typical Applications

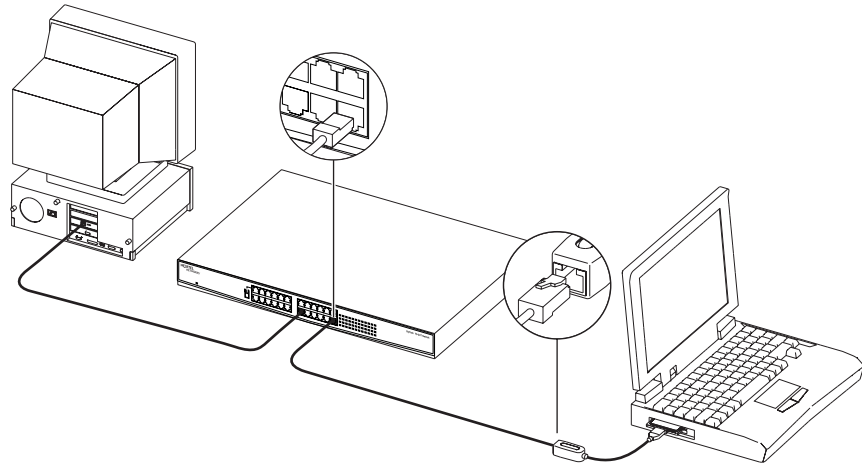
The BayStack 22 PC Card Adaptor provides you with network connectivity to your laptop computer. Attach the media coupler to the network card; then insert the network card into your laptop computer ([Figure 1-4](#)).



9477FA

**Figure 1-4. BayStack 22 Network Card Installation**

Use standard Ethernet cables to connect network devices, such as hubs, to the media coupler. You can then attach other devices to the hub to share network resources. [Figure 1-5](#) provides an example of a laptop computer attached to a BayStack 60-24T 10/100 Ethernet Hub. You can attach the hub to other workstations, printers, servers, and additional laptop computers.



9479FA

**Figure 1-5. Typical Application**



---

# Chapter 2

## Hardware Installation

This chapter describes how to install the components of the BayStack 22 PC Card Adapter in a portable (laptop) computer. Instructions for connecting the installed network card to the network are provided.



**Note:** You must connect all of the hardware, as described in this chapter, before installing the driver.

---

### Package Contents

The BayStack 22 network card package contains the following:

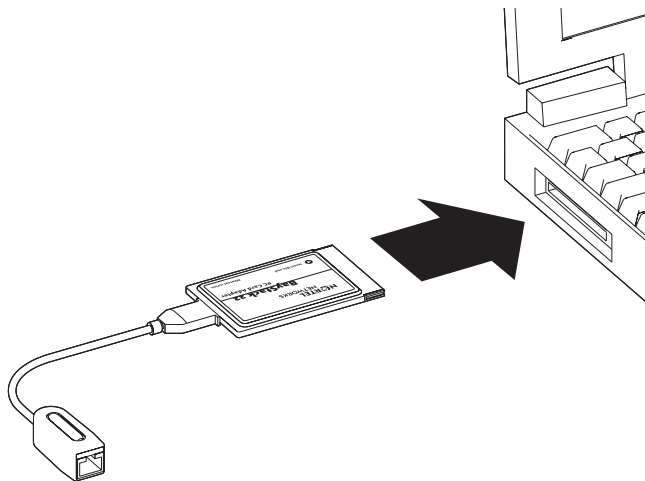
- BayStack 22 PC Card Adapter, including plastic protector case
- Media coupler, with cable
- *BayStack 22 PCMCIA Card Adapter Software & Documentation CD*, including technical documentation in PDF format
- Safety card
- Warranty/Registration card

## Installing the BayStack 22 PC Card Adapter

This section provides instructions for installing the BayStack 22 network card into a laptop computer. Computers vary in design; therefore, instructions and illustrations in this section may not exactly match your computer. However, the procedures will be similar.

To install the BayStack 22 network card in a computer:

1. **Shut down the computer.**
2. **Unplug the computer power cord from the power source.**
3. **Depress both sides of the 15-slot connector of the media coupler.**
4. **Connect the media coupler to the network card.**
5. **Be sure the media coupler connector clicks securely into place.**
6. **Insert the BayStack 22 network card into an empty CardBus PC Card slot on the laptop. The BayStack 22 network card label must be facing up ([Figure 2-1](#)).**



9477FA

**Figure 2-1. BayStack 22 Network Card Installation**

7. **Be sure the network card is firmly secured.**

8. **Connect the RJ-45 connector of a standard Ethernet cable to the RJ-45 port on the media coupler.**

Be sure to follow the cable guidelines described in [“Cable Requirements”](#) on [page 1-6](#).

9. **Connect the other end of the Ethernet cable to a network device, such as a hub or switch.**
10. **Attach a power cord to your laptop. Plug the cord into a power source.**
11. **Turn on power to the laptop.**
12. **Be sure any connected devices are receiving power.**

## Removing the BayStack 22 PC Card Adapter

You can easily remove the BayStack 22 network card from your laptop computer, if needed. Before you remove the network card you must stop the PCMCIA Card Service.



**Warning:** Do not remove the BayStack 22 network card from your laptop before stopping the PCMCIA Card Service. Your laptop will freeze if you remove the network card incorrectly.

---

To remove the BayStack 22 network card:

1. **From the Windows taskbar, choose Start > Settings > Control Panel.**
2. **Double-click PC Card (PCMCIA).**
3. **Select “Nortel Networks BayStack 22 PCMCIA card.”**
4. **Click Stop.**

An “It is ok to remove the PCMCIA card” message is displayed.
5. **Firmly grasp the network card and remove it from the computer.**
6. **Depress both sides of the 15-slot connector of the media coupler.**
7. **Remove the media coupler from the network card.**



---

## Chapter 3

# Software Installation

This chapter provides instructions for installing the BayStack 22 network driver software and configuring the BayStack 22 PC Card Adapter on your network. Drivers compatible with several operating systems are located on the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD*. You can install specific drivers for Windows 95, Windows 98, Windows NT, Novell NetWare 4.x, or other systems.

This guide provides instructions for installing the drivers for Windows 95, Windows 98, Windows NT, and Novell NetWare 4.x. You can read the RELEASE.txt file in the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD* for instructions to install drivers for other operating systems.

Different versions of Windows operating systems may have different installation screens than those shown in these instructions. Your installation screens may appear in a different order than those in this chapter. You will be prompted for the same information, regardless of the Windows version.

The BayStack 22 network card is automatically detected by Windows 95 and Windows 98. Follow the instructions during this automatic installation process. You will be prompted to insert the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD* into your laptop computer during the installation. The driver must be manually installed for Windows NT.



**Note:** The BayStack 22 PC Card Adapter may also be referred to as a PCMCIA Ethernet adapter or controller.

---

## Preinstallation

Perform the following tasks prior to installing the BayStack 22 network driver:

- Install the BayStack 22 network card before installing the BayStack 22 network driver.
- Remove all other network cards from the laptop computer. If you have other network cards or adapters installed in your computer, the driver installation process will not execute. You do not need to uninstall other network driver software before you run the installation.
- Be sure to have the Windows 95 or Windows 98 CD and the BayStack 22 network driver CD ready to use during the installation. You may be prompted to install either CD. You may receive the “Insert Disk” and “Please insert the disk labeled Windows...” messages. If you receive these messages, insert the appropriate CD, enter the appropriate drive letter and CD name, and click OK to continue the installation. For example, if drive D is your CD drive and you insert the Windows 95 CD, enter **d:\win95** when prompted.

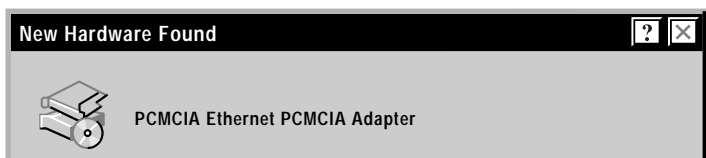
## Installing the Network Driver in a Windows 95 Environment

This section describes the steps required to install the driver software in a Windows 95 environment.

To install the driver:

1. **Turn on the power to the computer, and start Windows 95.**

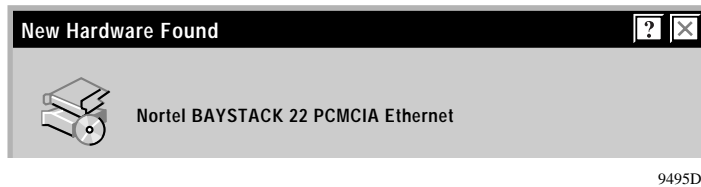
A generic New Hardware Found window opens ([Figure 3-1](#)).



9561DA

**Figure 3-1. New Hardware Found Window—Generic**

A second New Hardware Found window opens, identifying your BayStack 22 PC Card Adapter ([Figure 3-2](#)).



**Figure 3-2. New Hardware Found Window—BayStack 22 Network Card**

The Update Device Driver Wizard dialog box opens ([Figure 3-3](#)).

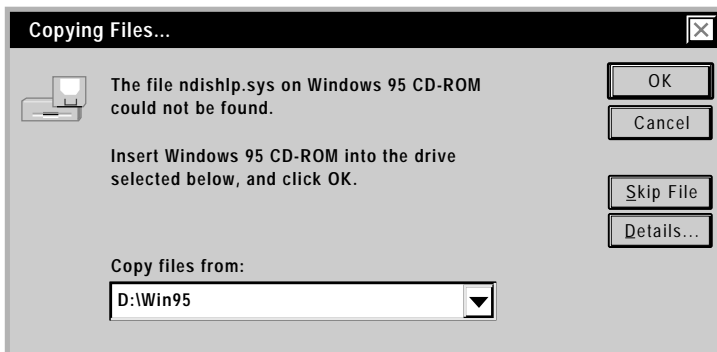


**Figure 3-3. Update Device Driver Wizard Dialog Box**

2. Insert the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD into the CD drive as prompted.

**3. Click Next.**

The Copying Files dialog box opens (Figure 3-4).



8528DD

**Figure 3-4. Copying Files Dialog Box**

**4. Insert the Windows 95 CD as indicated.**

The next Update Device Driver Wizard dialog box (Figure 3-5) indicates that the new BayStack 22 network card has been found and the driver is automatically loaded.



8527DD

**Figure 3-5. Update Device Driver Wizard Dialog Box—BayStack 22 Network Card**

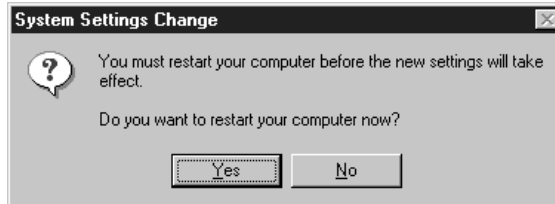


**5. Click Finish.**

Another Copying Files dialog box opens.

**6. Click OK.**

The System Settings Change dialog box opens ([Figure 3-6](#)).



**Figure 3-6. System Settings Change Dialog Box**

**7. Remove all CDs from the CD drive.**

**8. Click Yes.**

Restarting your system is necessary to enable your PC to finish setting up your new hardware.

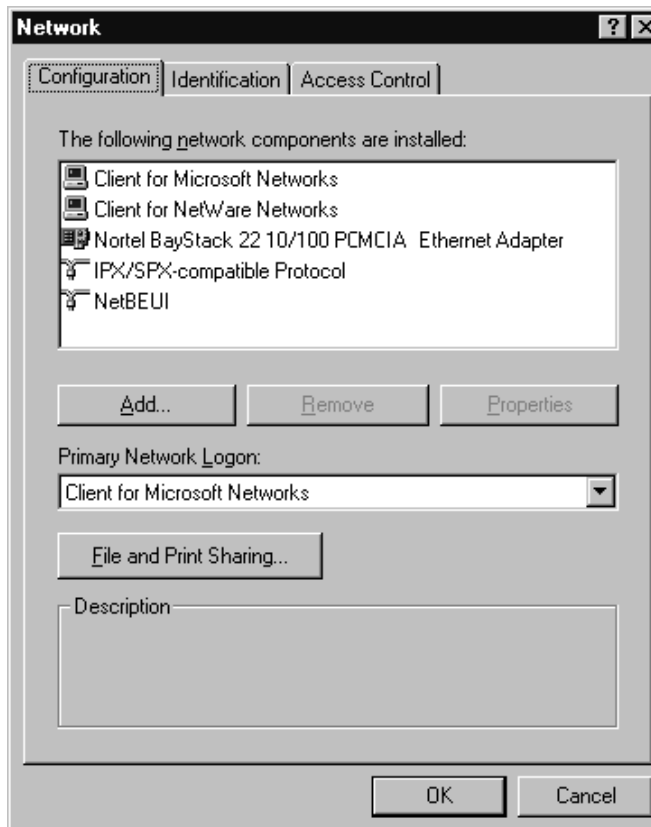
## Configuring the Windows 95 Environment

This section provides instructions for configuring the BayStack 22 network card on the network after you have installed the BayStack 22 network driver on your Windows 95 laptop computer.

To configure the network properties for your laptop:

1. **From the Windows taskbar, choose Start > Settings > Control Panel.**
2. **Double-click Network.**

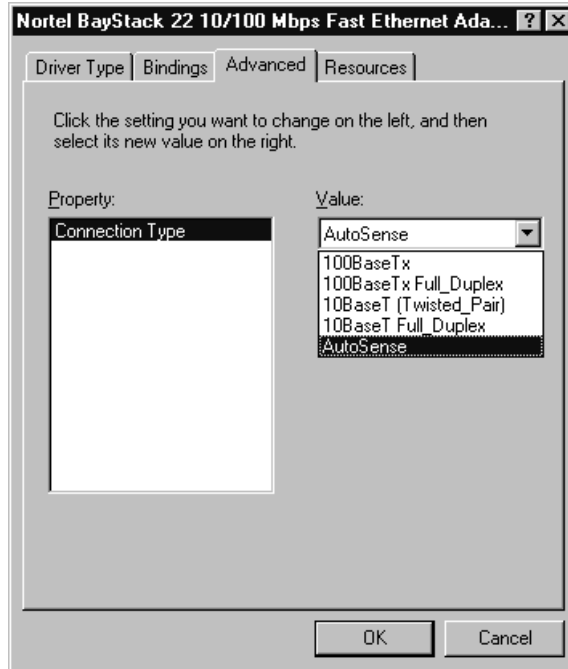
The Network dialog box opens. The configuration tab is displayed by default ([Figure 3-7](#)).



**Figure 3-7. Network Dialog Box—Configuration Tab**

### 3. Select Properties.

The Properties dialog box opens. The Advanced tab is displayed by default ([Figure 3-8](#)).



**Figure 3-8. Properties Dialog Box**

### 4. In the Property list, select Connection Type.

The AutoSense value is displayed by default.

### 5. In the Value list, select from the following connection speed types:

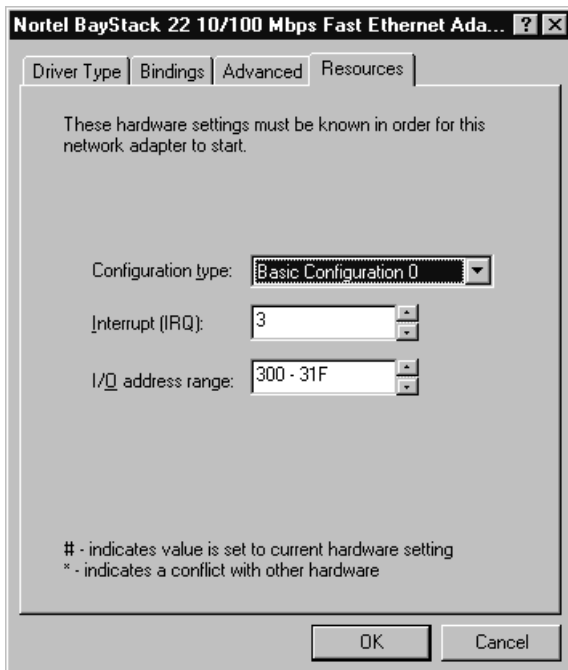
- AutoSense (Use this setting if you want the RJ-45 port on the media coupler to use the fastest speed supported by the attached device.)
- 100BASE-TX for 100 Mb/s connections
- 100BASE-TX or 10BASE-T full-duplex mode, for 10 and 100 Mb/s switch connections
- 10BASE-T twisted pair for 10 Mb/s connections

**6. Click OK.**

The Properties Dialog Box opens again ([Figure 3-8](#)).

**7. Click the Resources tab.**

The Resources dialog box opens ([Figure 3-9](#)).



**Figure 3-9. Resources Dialog Box**

**8. Enter the Configuration type, interrupt (IRQ) number, and I/O address range, or accept the default settings.**

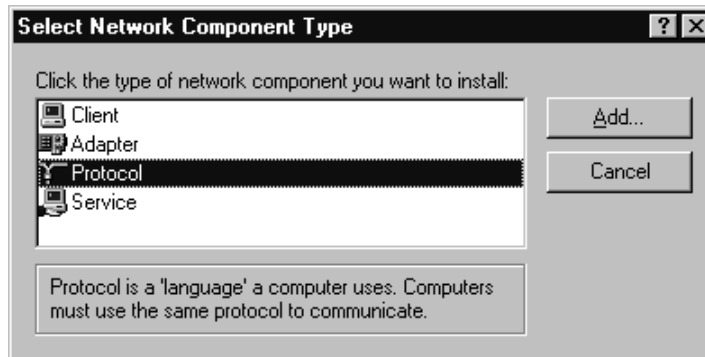
**9. Click OK.**

**10. Return to the Network Dialog Box > Configuration tab ([Figure 3-7](#)).**

**11. Click Add.**

**12. Select TCP/IP.**

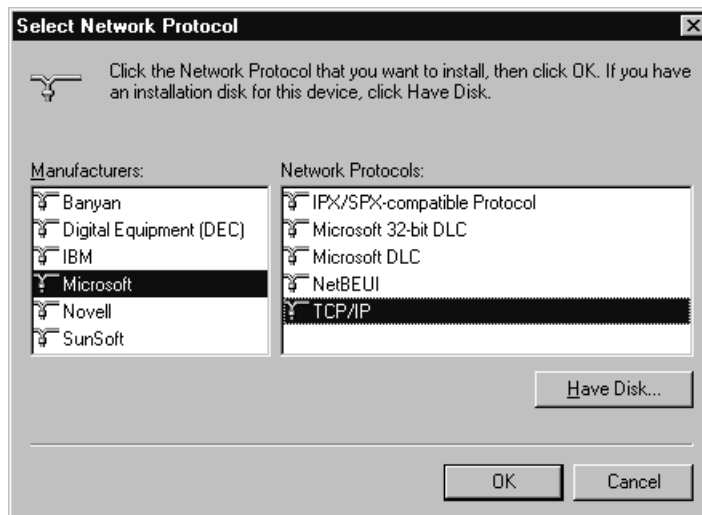
The Select Network Component Type dialog box ([Figure 3-10](#)) opens.



**Figure 3-10. Select Network Component Type Dialog Box**

**13. Select Protocol.****14. Click Add.**

The Select Network Protocol dialog box opens ([Figure 3-11](#)).

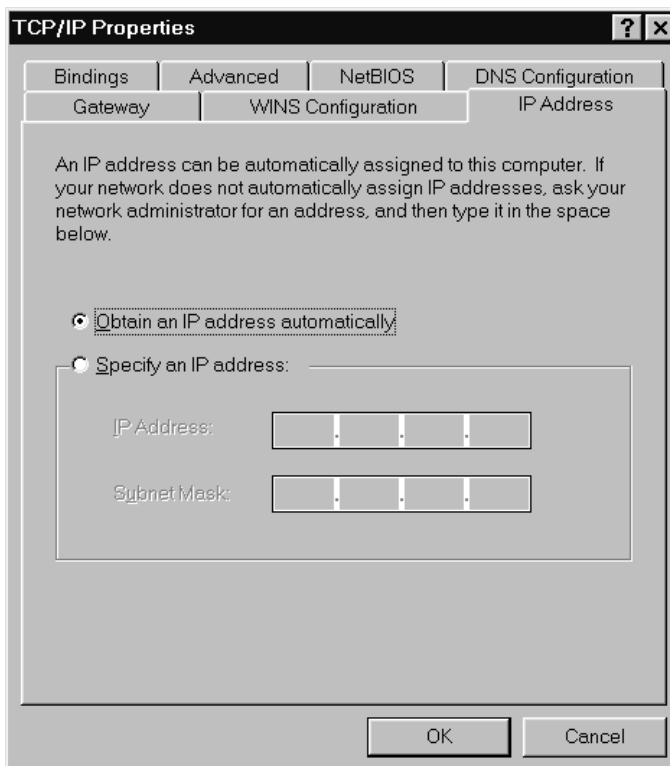


**Figure 3-11. Select Network Protocol Dialog Box**

**15. In the Manufacturers list, select Microsoft.**

16. In the Network Protocols list, select TCP/IP.
17. Click OK.
18. Return to the Configuration tab.
19. Select Properties.

The TCP/IP Properties dialog box opens ([Figure 3-12](#)).



**Figure 3-12. TCP/IP Properties Dialog Box**

20. Select the IP Address tab.
21. If the computer has a static IP address, specify the IP address, subnet mask, and default gateway of your computer.

You can also choose the “Obtain an IP address automatically” option if the computer does not have a static IP address. If you choose this option your IP address will be supplied by DHCP.

22. Use the Gateway or DNS Configuration tabs to configure other parameters, as needed.

23. Click OK.

The Copying Files dialog box is displayed.

24. In the “Copy files from:” field, enter the location of the requested files or CD.

25. Click OK.

The system restart dialog box opens. Restarting your system is necessary to enable your PC to finish setting up your new hardware.

26. Remove the CD from the CD drive.

27. Click Yes.

Your system restarts.

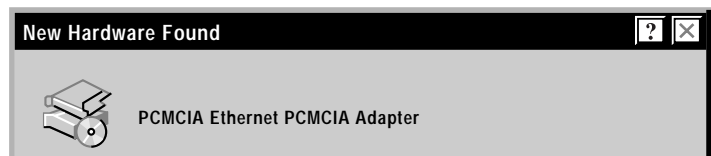
## Installing the Network Driver in a Windows 98 Environment

This section describes the steps required to install the driver software in a Windows 98 environment.

To install the network driver:

1. Turn on the power to the computer, and start Windows 98.

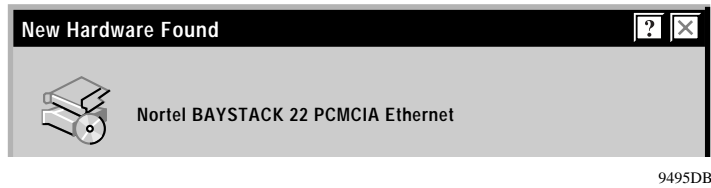
The New Hardware Found window opens, identifying a generic network card. For instance, the window may list “PCMCIA Ethernet Adapter, or PCMCIA Ethernet Controller” ([Figure 3-13](#)).



9561DA

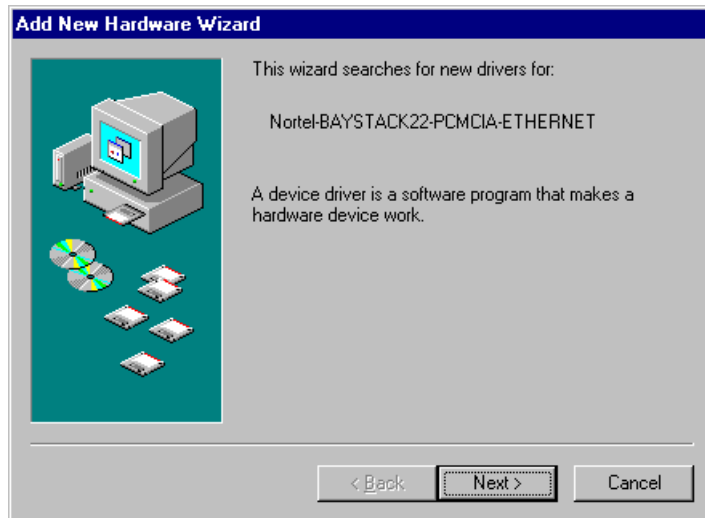
**Figure 3-13. New Hardware Found Window—Generic**

A second New Hardware Found window opens, identifying your BayStack 22 PC Card Adapter ([Figure 3-14](#)).



**Figure 3-14. New Hardware Found Window—BayStack 22 Network Card**

The Add New Hardware Wizard dialog box opens ([Figure 3-15](#)).



**Figure 3-15. Add New Hardware Wizard Dialog Box**



**2. Click Next.**

The Add New Hardware Wizard—Driver Selection dialog box opens ([Figure 3-16](#)).



**Figure 3-16. Add New Hardware Wizard—Driver Selection Dialog Box**

**3. Click Next.**

The Add New Hardware Wizard—Driver Location dialog box opens ([Figure 3-17](#)).



**Figure 3-17. Add New Hardware Wizard—Driver Location Dialog Box**

- 4. Insert the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD into your CD drive.**
- 5. Select CD-ROM drive.**

**6. Click Next.**

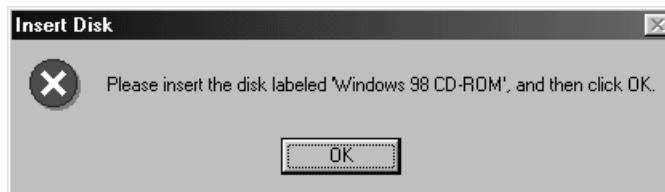
The Add New Hardware Wizard—Driver Search dialog box opens ([Figure 3-18](#)).



**Figure 3-18. Add New Hardware Wizard—Driver Search Dialog Box**

**7. Click Next.**

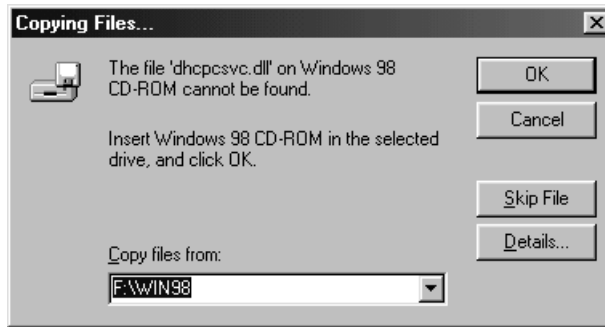
The Insert Disk message is displayed ([Figure 3-19](#)).



**Figure 3-19. Insert Disk Message**

**8. Click OK.**

The Copying Files dialog box opens ([Figure 3-20](#)).



**Figure 3-20. Copying Files Dialog Box**

**9. Insert your Windows 98 CD into the CD drive of your laptop.**

**10. Specify the letter of your CD drive and your Windows 98 CD.**

For instance, if drive F is your CD drive, enter **F:\WIN98**.

**11. Click OK.**

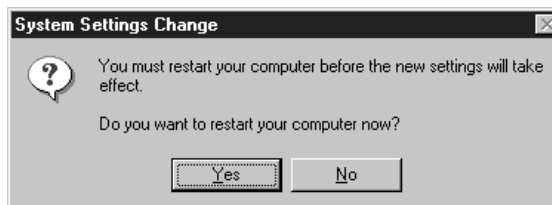
The Add New Hardware Wizard—Installation Finished dialog box opens ([Figure 3-21](#)).



**Figure 3-21. Add New Hardware Wizard—Installation Finished Dialog Box**

**12. Click Finish.**

The System Settings Change dialog box opens ([Figure 3-22](#)).



**Figure 3-22. System Settings Change Dialog Box**

Restarting your system is necessary to enable your PC to finish setting up your new hardware.

13. **Remove the CD from the CD drive.**

14. **Click Yes.**

Your system restarts.

## Configuring the Windows 98 Environment

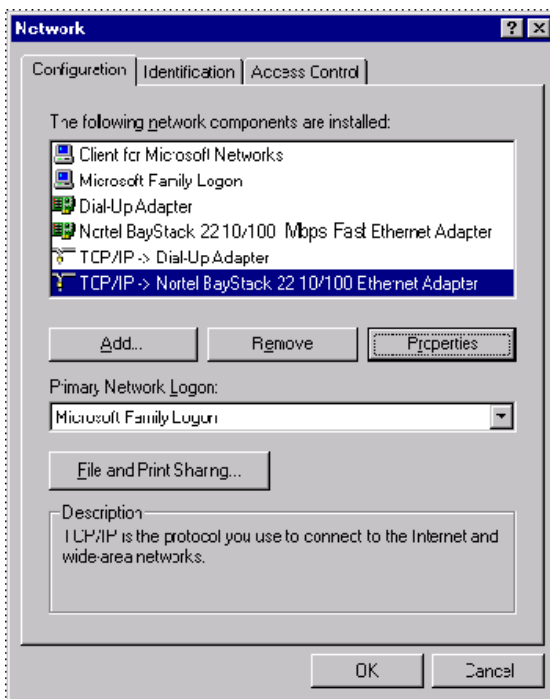
You must configure your laptop computer on the network after installing the BayStack 22 network driver on your Windows 98 laptop computer.

To configure the network properties for your laptop:

1. **From the Windows taskbar, choose Start > Settings > Control Panel.**
2. **Double-click Network.**

The Network dialog box opens. The TCP/IP network protocol for the BayStack 22 network driver is already installed.

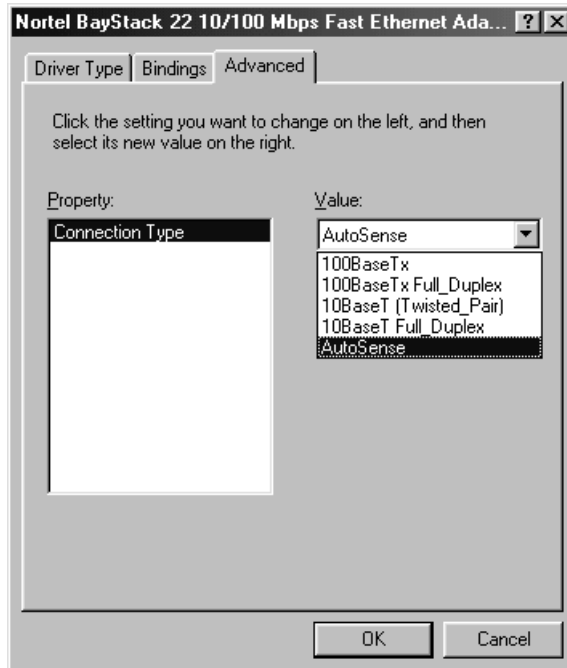
The configuration tab ([Figure 3-23](#)) is displayed by default.



**Figure 3-23. Network Dialog Box—Configuration Tab**

3. **Select Nortel BayStack 22 10/100 Mbps Fast Ethernet Adapter.**
4. **Click Properties.**

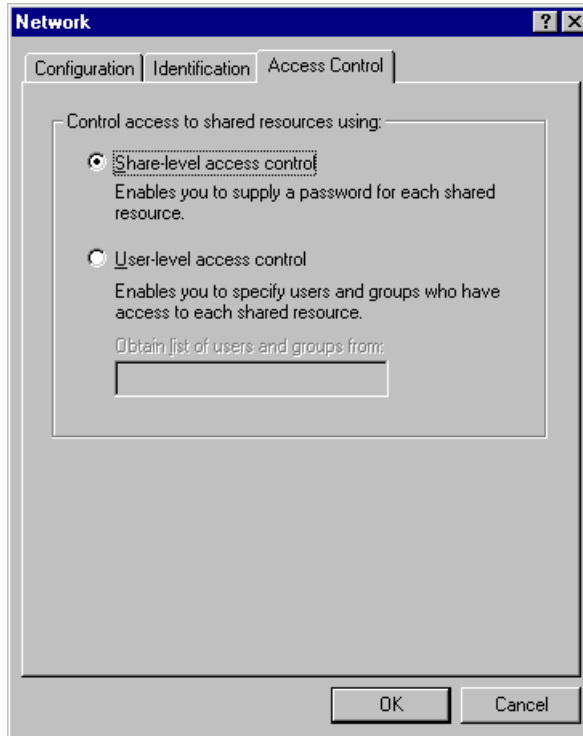
The BayStack 22 network driver dialog box opens ([Figure 3-24](#)).



**Figure 3-24. BayStack 22 Network Driver Dialog Box—Advanced Tab**

5. **Select the Advanced tab.**
6. **In the Property list, select Connection Type.**
7. **In the Value list, select one of the following:**
  - AutoSense—Select the default AutoSense setting if you want the port to use the fastest speed supported by the attached device.
  - 10BaseT (Twisted Pair)—Use this setting for 10 Mb/s Ethernet hubs.
  - 100BaseTx—Use this setting for 100 Mb/s Ethernet hubs.
  - 100BaseTx or 10BaseT full duplex—Use these settings for 100 Mb/s and 10 Mb/s Ethernet switches.

8. **Click OK.**
9. **Return to the Network dialog box (Figure 3-23).**
10. **Select the Access Control tab (Figure 3-25).**



**Figure 3-25. Access Control Tab**

11. **Select Share-level access control.**
12. **Click OK.**

The system restart dialog box opens.
13. **Remove all CDs from the CD drive.**
14. **Click Yes.**

Your system restarts.

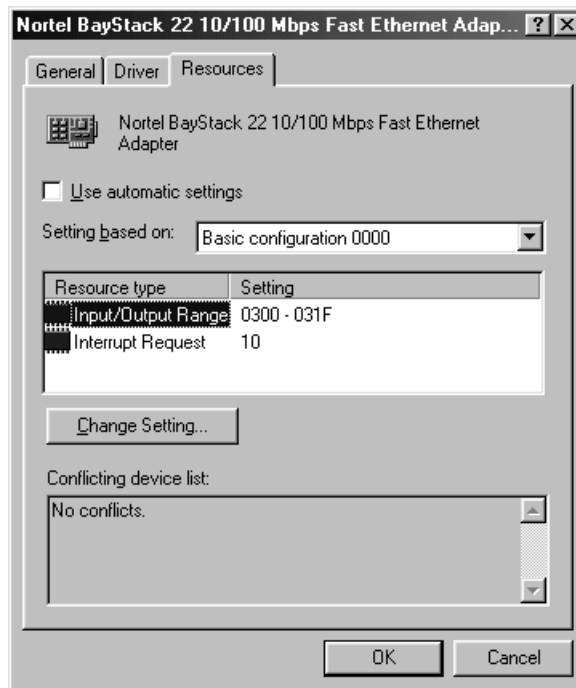


## Configuring the Interrupt Request

You can configure the Interrupt Request (IRQ) parameters. Nortel Networks recommends configuring the IRQ only if you are an expert at network or PC configuration.

To configure the IRQ:

1. **From the Windows taskbar, choose Start > Settings > Control Panel.**
2. **Double-click System.**
3. **Select the Resources tab ([Figure 3-26](#)).**



**Figure 3-26. Resources Tab**

4. **Clear the “Use automatic settings” box.**
5. **In the Resource type list, select Interrupt Request.**

**6. Click Change Setting.**

The Edit Interrupt Request dialog box opens ([Figure 3-27](#)).



**Figure 3-27. Edit Interrupt Request Dialog Box**

**7. Use the arrows next to the Value field to select an IRQ value.**

**8. Click OK.**

The Resources tab is displayed again. The new IRQ setting is displayed also.

**9. Click OK.**

The “Create a Forced Configuration” message is displayed.

**10. Click Yes.**

**11. Insert the Windows 98 CD into the CD drive of your laptop.**

## Installing the Network Driver in a Windows NT 4.0 Environment

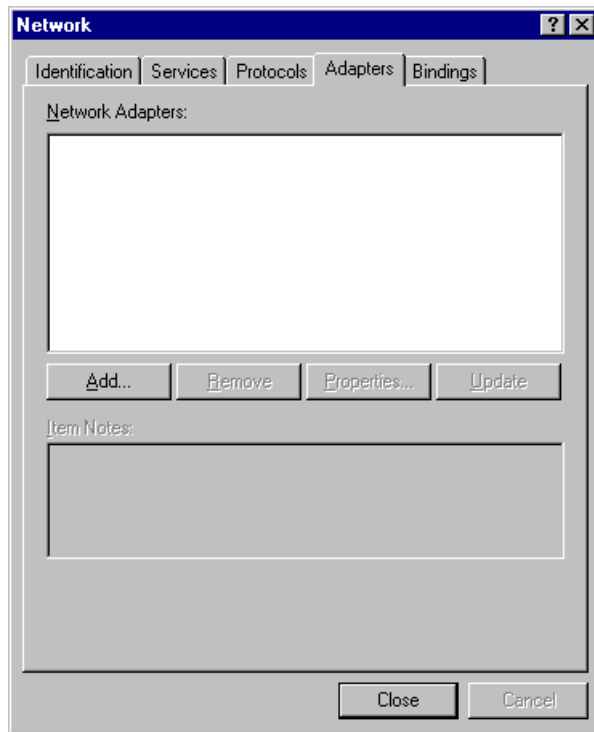
This section describes the steps required to install the network driver software in a Windows NT 4.0 environment.

To install the network driver in a laptop computer:

1. **Be sure that the standard network services are installed on the Windows NT 4.0 laptop.**
2. **From the Windows taskbar, choose Start > Settings > Control Panel.**
3. **Double-click Network.**

The Network dialog box opens. The Identification tab is displayed by default.

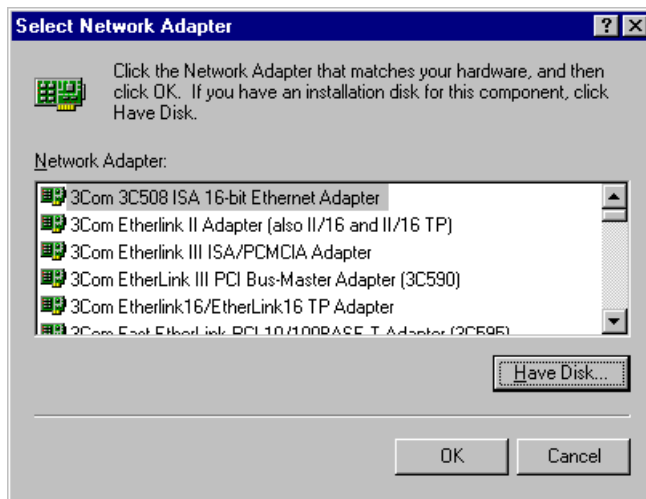
4. **Select the Adapters tab ([Figure 3-28](#)).**



**Figure 3-28. Network Dialog Box—Adapters Tab**

5. **Click Add.**

The Select Network Adapter dialog box opens ([Figure 3-29](#)).

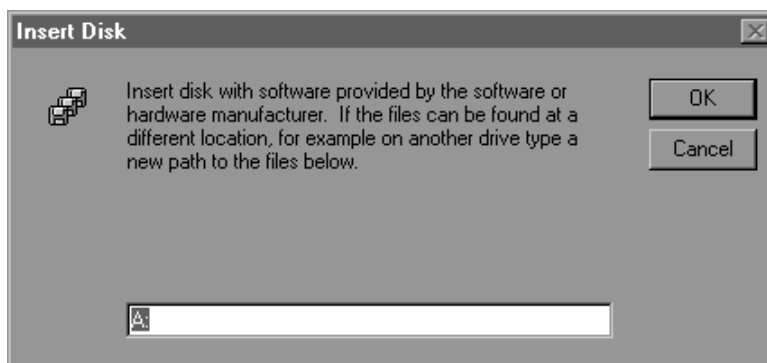


**Figure 3-29. Select Network Adapter Dialog Box**

6. **Click Have Disk.**

7. **Place the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD into the CD drive of your computer.**

The Insert Disk dialog box opens ([Figure 3-30](#)).



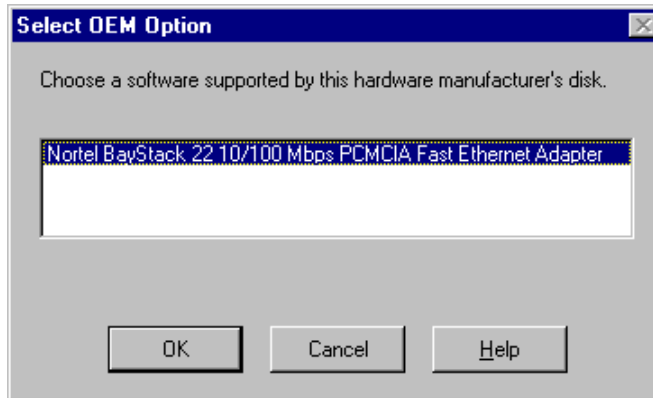
**Figure 3-30. Insert Disk Dialog Box**

**8. Specify the letter of the drive into which you installed the CD.**

Typically the CD drive is letter D.

**9. Click OK.**

The Select OEM Option dialog box ([Figure 3-31](#)) opens.

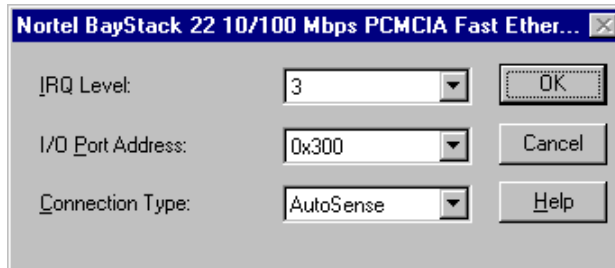


**Figure 3-31. Select OEM Option Dialog Box**

**10. Select the BayStack 22 PC Card Adapter.**

**11. Click OK.**

The Windows NT Configuration dialog box opens ([Figure 3-32](#)).



**Figure 3-32. Windows NT Configuration Dialog Box**

Set the following configuration parameters, or accept the default settings:

- IRQ level—Interrupt request level. IRQ Level 3 is the default.
- I/O Port Address—Input/Output memory address for the laptop computer. The BayStack 22 network driver installation for Windows NT does not automatically specify this address. You must configure it manually.
- Connection Type—Select one of the following settings:
  - AutoSense—Select the default AutoSense setting if you want the port to use the fastest speed supported by the attached device.
  - 100 or 10 half-duplex mode—Use these settings for 100 Mb/s and 10 Mb/s Ethernet hubs.
  - 100 or 10 half- or full-duplex mode—Use these settings for 100 Mb/s and 10 Mb/s Ethernet switches.

## Configuring the Windows NT Environment

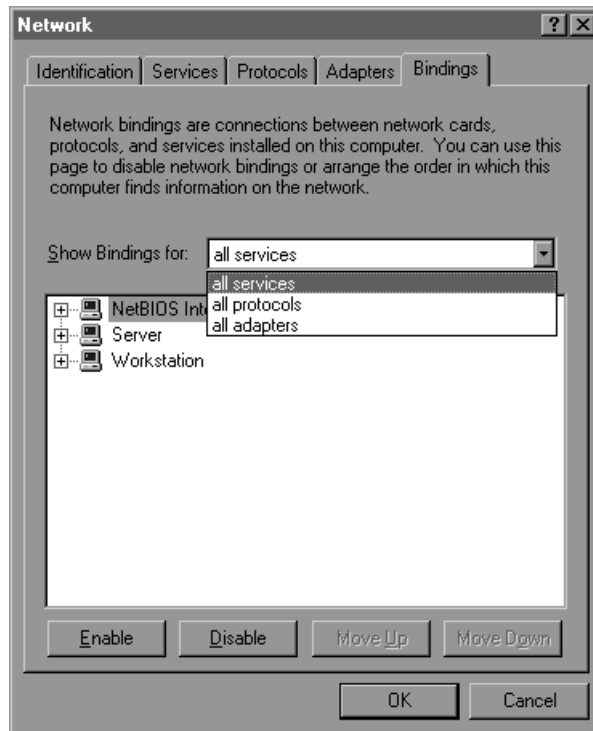
This section provides instructions for configuring the BayStack 22 network card on the network after you have installed the BayStack 22 network driver on a Windows NT laptop computer.

To configure the network properties for your Windows NT laptop:

1. **From the Windows taskbar, choose Start > Settings > Control Panel.**
2. **Double-click Network.**

The Identification tab is displayed by default.

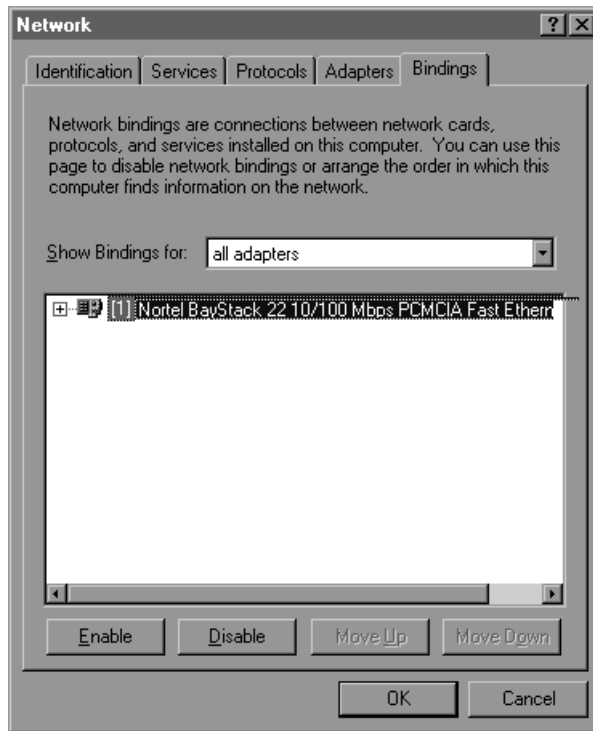
3. **Select the Bindings tab ([Figure 3-33](#)).**



**Figure 3-33. Bindings Tab**

The all services selection is the default.

4. **Select all adapters** ([Figure 3-34](#)).



**Figure 3-34. Bindings Tab—All Adapters Selection**

All of the adapters installed in your computer display.

5. **Verify that the BayStack 22 PC Card Adapter is displayed and selected.**
6. **Click OK.**

The Network dialog box is displayed again.



7. Select the IP address tab ([Figure 3-35](#)).



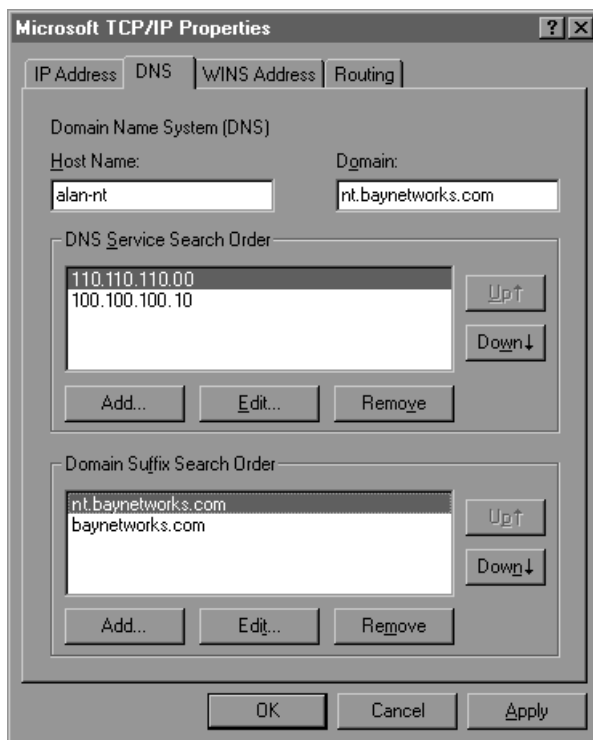
**Figure 3-35. IP Address Tab**

8. If the computer has a static IP address, specify the IP address, subnet mask, and default gateway of your computer.

You can also choose the “Obtain an IP address from a DHCP server” option if the computer does not have a static IP address.

9. Click OK.

10. Select the DNS tab ([Figure 3-36](#)) to configure point-to-point parameters if you are using an Internet service provider (ISP).



**Figure 3-36. DNS Tab**

11. Enter the host name and domain of your computer.
12. Enter the DNS service and domain suffix search order information for your ISP.
13. Click OK.

14. Select the WINS Address tab ([Figure 3-37](#)).

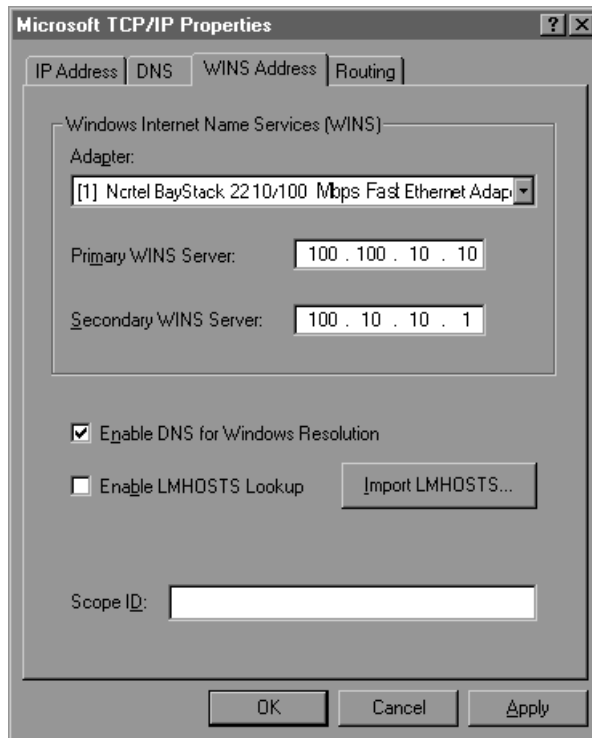


Figure 3-37. WINS Address Tab

15. Enter the IP address of your primary and secondary WINS servers.
16. Click OK.
17. Restart your system if prompted.

## Installing the Network Driver in a Novell NetWare 4.x Environment

This section describes the steps required to install the BayStack 22 network driver software in a Novell NetWare version 4.x environment. You must install and configure the software on your Novell server and client. Your laptop computer is considered the client.

If you are installing the BayStack 22 network driver software in a Novell NetWare version 3.12 environment, refer to the *Readme.txt* file on the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD*.

## Installing the Network Card in a Novell NetWare Server

This section describes the steps required to install the BayStack 22 network driver software in your Novell NetWare 4.x server.

Your laptop computer must have the following installed prior to installing the BayStack 22 network driver software:

- BayStack 22 PC Card Adapter
- MS-DOS operating system
- Novell NetWare 4.x server software

To install the BayStack 22 network driver in your Novell NetWare 4.x server:

1. **Insert the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD* into the CD drive of your server.**
2. **Verify that the following files are located in the Novell NetWare server directory.**
  - `\NETWARE\SERVER\4.X\MSM.NLM`
  - `\NETWARE\SERVER\ETHERSM.NLM`
3. **If the files listed in step 2 are not located in the server directory, copy these files from the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD*.**

**4. Copy the following file from the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD to the root directory.**

- `\ENABLER\B22ENA10.EXE`

You can also run the *BS22ENA10.EXE* program from the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD instead of copying the program to your root directory.

**5. Access a DOS prompt screen.**

From the DOS prompt you must run the *BS22ENA10.EXE* program before installing the BayStack 22 network driver.

**6. Enter the following syntax:**

**B22ENA10 [/IRQ:x][/IOP:xxx]**

where:

- IRQ is the interrupt number used specifically for the BayStack 22 network card. This number must not be used by any other device in the system. The default IRQ value is 3.
- IOP is the starting Input/Output (I/O) port address, in hexadecimal format. The BayStack 22 network card requires 32 consecutive free I/O port addresses. The default IOP value is 0x300.

For example, the following command enables a BayStack 22 network card having an IRQ value of 5 and an IOP value of 300:

**B22ENA10 /IRQ:5 /IOP:300**

**7. Change to the Novell NetWare server directory.**

For instance, type the command:

**CD\NWSERVER**

**8. Type:**

**SERVER**

**9. Press Enter.**

**10. At the server prompt, enter:**

**LOAD INSTALL**

The NetWare Server Installation Utility loads.

**11. From the Installation Options menu, select Driver options.**

12. **Press Enter.**
13. **From the Driver Options menu, select Configure network drivers.**
14. **Press Enter.**
15. **From the Additional Driver Actions menu, select Select a driver.**
16. **Press Enter.**
17. **Press Insert (<INS>) to install an unlisted driver.**

By default, your a: drive is scanned.
18. **Press <F3> to specify another path or drive.**
19. **Specify the directory on the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD where the Novell NetWare drivers are located.**

For example, type **D:\NETWARE\SERVER**.
20. **Insert the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD in the CD drive of your server.**
21. **Press Enter.**

The following file is automatically copied from the *BayStack 22 PCMCIA Card Adapter Software & Documentation* CD to your server:

  - **\NETWARE\SERVER\B22LAN10.LAN**
22. **From the Select a driver to install: menu, select Nortel 22 10/100 PCMCIA Fast Ethernet Adapter.**
23. **Press Enter.**

The “Do you want to copy driver B22LAN10.LAN (Y)(N)” message is displayed.
24. **Select Yes.**
25. **Proceed to the next section, [“Specifying Driver Parameters”](#) on [page 3-35](#), if you want to specify driver parameters or complete the following 3 steps.**
26. **Type:**

**down**

The server closes.

**27. Type:****exit**

Your system returns to the DOS prompt.

**28. In the DOS prompt, type:****server**

The BayStack 22 network card and the server on the Novell NetWare network open and are functioning.



**Note:** Each time you reboot your server, you must run the B22ENA10.EXE program to enable the BayStack 22 network card.

---

### Specifying Driver Parameters

The BayStack 22 network driver installs with default parameters. You can set specific driver parameters for the driver if you do not want to use the default settings.

To set specific driver parameters:

- 1. From the Board BayStack 22 (Driver B22LAN10) Actions menu, select “Select/Modify driver parameters and protocols.”**

- 2. Press Enter.**

The default protocol is IPX. You can also select TCP/IP or AppleTalk.

- 3. Select a protocol from the available options.**

- 4. Specify the slot number (slot#).**

- 5. Select “Save parameter and load select driver.”**

If you select the IPX protocol, the network number (network #) is randomly generated.

- 6. Press Enter at each of the following four prompts:**

- 802.3
- 802.2
- SNAP
- Ethernet II

7. **Type:**

**down**

The server closes.

8. **Type:**

**exit**

Your system returns to the DOS prompt.

9. **In the DOS prompt, type:**

**server**

The BayStack 22 network card and the server on the Novell NetWare network open and are functioning.



**Note:** Each time you reboot your server, you must run the B22ENA10.EXE program to enable the BayStack 22 network card.

---

## Installing the Network Card in a Novell NetWare Client

This section describes the steps required to install the BayStack 22 network driver software on your Novell NetWare 4.x laptop computer, or client. You must have already installed a BayStack 22 PC Card Adapter in your laptop.

To install the BayStack 22 network driver on your Novell NetWare 4.x client:

1. **Verify that your BayStack 22 network card is properly installed in your Novell NetWare 4.x laptop.**
2. **Insert the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD* into your laptop.**
3. **Access a DOS prompt screen.**

From the DOS prompt you must run the *BS22ENA10.EXE* program before installing the BayStack 22 network driver.



4. Enter the following syntax:

**B22ENA10 [/IRQ:x][/IOP:xxx]**

where:

- IRQ is the interrupt number used specifically for the BayStack 22 network card. This number must not be used by any other device in the system. The default IRQ value is 3.
- IOP is the starting input/output (I/O) port address, in hexadecimal format. The BayStack 22 network card requires 32 consecutive free I/O port addresses. The default IOP value is 0x300.

For example, the following command enables a BayStack 22 network card having an IRQ value of 5 and an IOP value of 300:

**B22ENA10 /IRQ:5 /IOP:300**



**Note:** If you installed the *EMM386.EXE* program in CONFIG.SYS, you must exclude the memory address range D000 to DFFF or D400 to D7FF in the *EMM386.EXE* program. The *B22ENA10.EXE* program uses this memory address range to read configuration information from the BayStack 22 network card.

For example, the following commands exclude the required memory address range:

**DEVICE=EMM386.EXE NOEMS X=D400-D7FF**

**DEVICE=EMM386.EXE NOEMS X=D000-DFFF**

5. Access the Novell NetWare client directory on your client laptop.

6. From the \NETWARE\DOSODI directory on the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD*, copy the following files:

**LSL.COM  
B22ODI10.COM  
IPXODI.COM  
NETX.EXE  
NET.CFG**

The *STARNET.BAT* file in the \NETWARE\DOSODI directory executes the first four files automatically, in the correct sequence. Refer to [“Client Files”](#) on [page B-4](#) for descriptions of these files.

**7. Press Enter.**

You can now log in to your network.

**8. Edit the *NET.CFG* file to specify driver parameters, as needed.**

You can specify the PORT, IRQ, NWAY, and S10/S10FD/S100/S100FD parameters.

Refer to [Appendix B, “Novell NetWare Reference Information,”](#) for sample *NET.CFG* files.

---

# Chapter 4

## Troubleshooting

This chapter provides several methods for troubleshooting problems related to the BayStack 22 PC Card Adapter.

### Diagnostic LEDs

Three LEDs on the media coupler of the BayStack 22 network card provide diagnostic information. The 10 and 100 Mb/s Link LEDs indicate successful network connections to Ethernet and Fast Ethernet devices, respectively. The Link LEDs remain steady if the connection is stable. You should check the RJ-45 connection if the LED is not steady. The Activity LED indicates active network traffic.

[Table 4-1](#) describes the Link and Activity LED indications.

**Table 4-1. LED Indications**

Label	Color	Activity	Description
10M	Green	On	A 10 Mb/s connection has been established.
		Off	Power is not supplied to the network card, or a 10 Mb/s connection is not established.
100M	Green	On	A 100 Mb/s connection has been established.
		Off	Power is not supplied to a network card, or a 100 Mb/s connection is not established.
ACT	Green	On	Heavy network traffic is passing through the port.
	Green	Blinking	Network traffic is passing through the connected port. The rate of blinking is proportional to the amount of network traffic.

## Hardware Issues

Perform the following tasks to check for hardware problems:

- Verify that you are using the correct cables and the correct cable lengths, as described in [“Cable Requirements”](#) on [page 1-6](#).
- Make sure the media coupler is firmly connected to the network card and to a network device.
- Use a different port on the network device.
- Verify that the BayStack 22 network card is fully and firmly seated in the slot connector in the computer. Check the connector edges of the card for damage.
- Replace the network card in question with a network card that you are sure functions properly. Run generic network interface card diagnostic tests.
- Install the network card in question into another computer and run the tests again.
- Remove all other network cards from the computer and run the tests again. If the verification/diagnostic run is not normal, there is probably an interrupt number conflict. You must manually resolve the conflict by running a CMOS Setup utility after you have reinstalled the expansion cards.

## Software Issues

Perform the following tasks to check for software problems:

- Verify that the proper driver is loaded, as explained in [Chapter 3, “Software Installation.”](#) Be sure you followed the directions for the operating system you are running on the computer.
- Check that the new configurations match the configurations of the network device if you have manually configured the speed or mode of the network card. Nortel Networks recommends setting the network card to autonegotiation when installing the network driver.
- Verify that the PCMCIA slot in the computer is an enabled bus-master slot. Some computers may require that you configure the PCMCIA slot to enable bus mastering. Refer to your computer manual for information about the PCMCIA BIOS setup program.
- Verify that your BIOS software correctly supports the PCMCIA Local Bus Specification, version 2.0 or later. Upgrade your BIOS software if needed.

- Determine whether or not the network card slot is deactivated at the BIOS level. Use the CMOS Setup utility in your computer to provide the option to activate or deactivate slots.
- Disable the Plug and Play option (PnP) in the BIOS setup program if it is recommended by your PC manual. Some computers may require you to perform this task. Incorrectly assigned resources between network cards may cause problems.



**Note:** Always consult your computer manual for information about changing motherboard jumper and BIOS settings. If you modify the BIOS settings, make sure the jumper and BIOS settings match.

---

- You may need to reserve interrupts and memory addresses for installed Industry Standard Architecture (ISA) cards to prevent PCMCIA cards from using the same settings. Refer to your PC manual for instructions.



---

# Appendix A

## Technical Specifications

Tables in this appendix provide technical product specifications and list the available software drivers for the BayStack 22 PC Card Adapter.

### Product Specifications

[Table A-1](#) lists technical specifications for the BayStack 22 network card.

**Table A-1. Technical Specifications**

---

<b>Standards Compatibility</b>	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX PC Card 95 CardBus Standard
<b>EMC Compliance</b>	
CE Mark:	EN50081-1 EN55022 IEC1000-4-2/3/4/6
Emissions:	FCC Class B VCCI Class B EN55022 (CISPR 22) Class B
<b>Physical Dimensions</b>	
Network Card:	86 x 54 x 5.0 mm (3.37 x 2.13 x 0.2 in)
Media Coupler:	222 mm (8.75 in) (including connectors)
<b>Weight</b>	30g (1.94 oz)
<b>Environment</b>	
Operating:	0° to 55° C (32° to° 131° F)
Humidity:	10% to 9%, noncondensing
<b>Power Consumption</b>	+5 V DC at 145mA (Standby) +5 V DC at 300mA (Transmit)

---

**Table A-1. Technical Specifications**

<b>Network Interface</b>	
10BASE-T:	RJ-45 (UTP Cable, Categories 3, 4, 5)
100BASE-TX:	RJ-45 (UTP Cable, Category 5)
<b>Data Interface</b>	32-bit bus-mastering PCI
<b>I/O Address</b>	Detected by BIOS or Card Service
<b>System Clock</b>	20 to 33 MHz
<b>Interrupt</b>	INT A, mapping to BIOS IRQ setup
<b>LED Indicators</b>	10 Mb/s, 100 Mb/s, Activity

## Software Drivers

[Table A-2](#) lists the available software drivers for the BayStack 22 network card. Refer to [Chapter 3, “Software Installation,”](#) for installation instructions for the Windows-based drivers. Refer to the README files associated with other drivers for installation instructions.

**Table A-2. Available Software Drivers**

<b>Driver</b>	<b>Compatible Operating Systems</b>
Network Device Interface Specifications (NDIS)	Microsoft Windows 95, Windows 98 Microsoft Windows NT 3.51, 4.0 Microsoft Windows for Workgroups 3.11 Microsoft LAN Manager 2.x Banyan VINES DEC Pathworks IBM TCP/IP for DOS LAN Support program SUN PC-NFS
NetWare Open Data-Link Interface (ODI)	Novell NetWare 3.x, 4.x NetWare LAN Workplace TCP/IP Novell LAN Analyzer for NetWare Novell Personal NetWare
Packet	IFTP PC/TCP NCSA TCP/IP



---

# Appendix B

## Novell NetWare Reference Information

This appendix provides reference files for your Novell NetWare 4.x operating system. Server and client information is provided in the following sections.

If you are installing the BayStack 22 PCMCIA Network Driver software in a Novell NetWare version 3.12 environment, refer to the *Readme.txt* file on the *BayStack 22 PCMCIA Card Adapter Software & Documentation CD*.

### Novell NetWare Server Files

This section provides information about the Novell NetWare 4.x files in general, and specifically about the *AUTOEXEC.NCF* file parameters.

### File Descriptions

[Table B-1](#) provides descriptions of the Novell NetWare server files.

**Table B-1. Server Files**

File Name	Description
README.TXT	A summary of the BayStack 22 network driver installation for the Novell NetWare server.
B22ENA10.EXE	Enabling DOS program for the BayStack 22 network driver.
B22LAN10.LAN	BayStack 22 32-bit ODI server driver.
B22LAN10.LDI	BayStack 22 network driver installation information.
ETHERTSM.NLM	NetWare Server 3.1X, 4.1X LAN driver Topology Specific Module (TSM) for Ethernet.
3.1X\NBI31X.NLM	NetWare Server 3.1X Bus Interface module.
3.1X\MSM31X.NLM	NetWare Server 3.1X LAN driver Media Support Module (MSM).
4.X\MSM.NLM	NetWare Server 4.x LAN driver Media Support Module (MSM).

## Sample *AUTOEXEC.NCF* Files

Sample files and file parameters are provided in this section.

The following files are typically part of the *AUTOEXEC.NCF* file:

```
LOAD C:NBI
LOAD C:MSM
LOAD C:ETHERTSM
LOAD C:B22LAN10 FRAME=ETHERNET_802.2 NAME=E_8022
LOAD C:B22LAN10 FRAME=ETHERNET_802.3 NAME=E_8023
LOAD C:B22LAN10 FRAME=ETHERNET_II NAME=E_II
LOAD C:B22LAN10 FRAME=ETHERNET_SNAP NAME=E_SNAP
BIND IPX E_8022 NET=10
BIND IPX E_8023 NET=20
BIND IPX E_IINET=30
BIND IPX E_SNAP NET=40
```

### ***AUTO.EXEC.NCF* File Parameters**

This section describes the *AUTOEXEC.NCF* file parameters FRAME, INT, PORT, and S10/S10FD/S100/S100FD.

#### ***FRAME Parameter***

The FRAME parameter specifies which type of frame is used by the BayStack 22 network driver.

Accepted values include:

- Ethernet\_802.3
- Ethernet\_802.2
- Ethernet\_II
- Ethernet\_SNAP

Multiple frame types can be enabled by loading the same driver with different FRAME type parameters.

The following are examples of typical FRAME parameters:

```
LOAD B22LAN10 FRAME=ETHERNET_802.2
LOAD B22LAN10 FRAME=ETHERNET_802.3
LOAD B22LAN10 FRAME=ETHERNET_II
LOAD B22LAN10 FRAME=ETHERNET_SNAP
```

### ***INT Parameter***

The INT parameter refers to the interrupt (IRQ) value used by the BayStack 22 network card. The INT value must match the IRQ value you specify when enabling the *B22ENA10* program. You must use a DOS prompt to enable this program before you access your Novell NetWare 4.x server. Refer to [“Installing the Network Card in a Novell NetWare Server”](#) on [page 3-32](#) for instructions.

The following is an example of a typical INT parameter:

```
LOAD B22LAN10 INT=3 FRAME=ETHERNET_802.2
```

### ***PORT Parameter***

The PORT parameter reflects the input/output (I/O) port address of the server. The PORT value must match the IOP value you specify when enabling the *B22ENA10* program. You must use a DOS prompt to enable this program before you access your Novell NetWare 4.x server. Refer to [“Installing the Network Card in a Novell NetWare Server”](#) on [page 3-32](#) for instructions.

The following is an example of a typical PORT parameter:

```
LOAD B22LAN10 INT=3 PORT=300 FRAME=ETHERNET_802.2
```

### ***S10, S10FD, S100, S100FD Parameters***

The S10, S10FD, S100, S100FD parameters specify the connection type of the BayStack 22 network card. The connection type includes transmission speed (10 or 100 Mb/s) and full- or half-duplex operation. These parameters are mutually exclusive; you can select only one parameter at a time from the command line. If you do not select any of these parameters, the default connection type is autonegotiation. [Table B-2](#) describes each parameter.

**Table B-2. Server Connection Type Parameters**

<b>Parameter</b>	<b>Connection Type</b>
S10	10 Mb/s, half-duplex
S10FD	10 Mb/s, full-duplex
S100	100 Mb/s, half-duplex
S100FD	100 Mb/s, full-duplex

The following is an example of a connection type parameter set to 10 Mb/s transmission speed and full-duplex mode:

```
LOAD B22LAN10 INT=3 PORT=300 FRAME=ETHERNET_802.2 S10FD
```

## **Novell NetWare Client Files**

This section provides information about client and *NET.CFG* files.

### **Client Files**

[Table B-3](#) briefly describes the files you use when installing the BayStack 22 network driver into your Novell NetWare client.

**Table B-3. Client Files**

<b>Command</b>	<b>Description</b>
LSL.COM	Supports the OSI link support layer
B22ODI10.COM	Client BayStack 22 network driver file
IPXODI.COM	Default protocol stack
NETX.EXE	Server connection
NET.CFG	Optional configuration file

---

## **NET.CFG Files and Parameters**

This section contains a sample *NET.CFG* file and describes the parameters of this file.

### **Sample NET.CFG File**

You can specify the DOC ODI driver in the *NET.CFG* file. The following is a sample *NET.CFG* file:

#### **Protocol**

**Bind B22ODI10**

#### **LINK DRIVER B22ODI10**

**Port 300**

**IRQ 5**

**; NWAY**

**; S10**

**; S10FD**

**; S100**

**; S100FD**

#### **NetWare DOS Requester**

**FIRST NETWORK DRIVE = F**

**NETWARE PROTOCOL = NDS BIND**

### **NET.CFG File Parameters**

This section describes the *NET.CFG* file parameters PORT, IRQ, NWAY, and S10/S10FD/S100/S100FD.

#### **PORT Parameter**

The PORT parameter specifies the input/output (I/O) address in hexadecimal format. This value must match the value reported by the *B22ENA10.EXE* program. The default value is 300.

#### **IRQ Parameter**

This parameter specifies the interrupt (IRQ) value for the BayStack 22 network card. This value must match the value reported by the *B22ENA10.EXE* program. The default value is 5.

### ***NWAY Parameter***

The *NWAY* parameter specifies the connection type as auto-negotiation, which is also the default connection type.

### ***S10/S10FD/S100/S100FD Parameters***

The *S10*, *S10FD*, *S100*, and *S100FD* parameters specify the connection type of the BayStack 22 network card. The connection type includes transmission speed (10 or 100 Mb/s) and full- or half-duplex operation. These parameters are mutually exclusive; you can select only one parameter at a time from the command line. If you do not select any of these parameters, the default connection type is autonegotiation (*NWAY*). [Table B-4](#) describes each parameter.

**Table B-4. Client Connection Type Parameters**

<b>Parameter</b>	<b>Connection Type</b>
S10	10 Mb/s, half-duplex
S10FD	10 Mb/s, full-duplex
S100	100 Mb/s, half-duplex
S100FD	100 Mb/s, full-duplex

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